STYLE OF METEOROLOGICAL PUBLICATIONS.

It would be well if certain meteorological institutions, in publishing the results of observations, would keep in view the requirements of the libraries in which their publications are to be bound and preserved. The Weather Bureau Library is embarrassed by the receipt of many periodical printed reports of unwieldy size. In other cases the size of page varies from year to year, or is even altered in the middle of a year; and again the publications of a single institution exhibit a variety of sizes in reports which, but for this fact, it would be desirable to bind in one volume.

The latter case is illustrated by the publications of the Meteorological Service of the Azores. These consist of single sheets of three different sizes. The type is unnecessarily large and two of the three forms of page used are of awkward dimensions. A uniform quarto page might be substituted in these cases by the use of smaller type.

The Anales del Instituto Físico-geográfico Nacional de Costa Rica, in which are published the very complete meteorological observations made by the Institute at San José, were formerly issued in a size not much exceeding the quarto, and small enough to be accommodated on the quarto shelves of libraries. Volume IX, however, which has recently been received by the Weather Bureau, is an unwieldy folio, having a page 16 by 12 inches, about one third of which (on most of the pages) is waste margin. Though the binder will reduce these dimensions somewhat, the volume will still be too large to be placed with the earlier numbers, an obvious disadvantage to any one consulting the file.

Capricious changes in the titles of serials, eccentricities in pagination, and many other vagaries on the part of authors and editors might be mentioned in this connection, but would take us too far afield.—*C. F. T.*

COSMIC RELATIONS OF THE ATMOSPHERE.

In reviewing a recent work by J. M. Schaeberle, of Ann Arbor, Mich., as published in the Astronomische Nachrichten, Dr. Johann Riem, of Berlin, has the following paragraph in the Beiblätter for 1906, page 57:

The assumption that certain terrestrial phenomena, like auroras and magnetic disturbances, occur when the earth passes through streams of matter emanating from the sun, is generally opposed by the fact that there is no common periodicity in these phenomena. On the other hand Schaeberle shows that such a periodicity is not to be expected, unless one assumes that the initial velocity with which the matter proceeds from the sun is the same in all these streams. He computes a table giving the following quantities for the respective initial velocities, V_0, in English miles per second; namely, T_1, the time, expressed in days, elapsing until the stream starting from the sun reaches the orbit of the earth; r, the distance (in radii of the earth's orbit as unit) to which the particles can attain; V_1, the velocity in miles per second with which they pass the earth's orbit; and T_2, the interval in days within which the current passing out of the earth's orbit returns to it again, as shown in the following table:

V_0	T_1	r	V_1	T_2
376.76	64.6	1.0	0.0	.....
381.56	33.2	2.0	18.3	332
381.78	29.7	4.0	22.4	1003
381.93	28.8	6.0	23.6	1869
382.00	27.4	∞	25.9	∞

From this it appears that while the velocity, V_1, with which the particles cut across the earth's orbit may increase from 0 to 26 miles, the initial velocity increases by only one-tenth of 1 per cent.[1] With an initial velocity of 382 miles per second, or above it, the material is scattered through space to infinity; for less velocities, after an interval of from 27 to 65 days, we get traces of an influence on the earth. If the current has considerable inclination to the vertical at the sun's surface, then the phenomena are considerably more complex.

[1]Thus in the text; but 1.4 per cent would seem to be correct.—*C. A.*

Applying this argument to a comet, of which V is the radial component of the stream, and v the velocity of the comet in its orbit, then the relative velocities before and after the perihelion passage will be as $V+v$ to $V-v$. This explains the variation in the comet's brightness and the departures from the law that would make the diminution of brightness a simple function of the distances from the sun and the earth to the comet.

THE PROVINCE OF THE MONTHLY WEATHER REVIEW.

Several scientific periodicals are published in the United States in which attention is given to meteorology. The oldest of these is the American Journal of Science in which Redfield, Mitchell, Olmstead, Hare, Loomis, Tracy, Ferrel, DeForrest, and others published important papers. The well-known journal "Science," beginning about 1875, has continued to offer a field for the interchange of views on every branch of meteorology and has been distinguished by the number of short articles as compared with the longer elaborate investigations. The only periodical specially devoted to meteorology was the American Meteorological Journal founded by Harrington in 1884, and maintained at his own private expense until 1892, when it was adopted by the New England Meteorological Society and Ginn and Co., publishers.

With the advent of Professor Harrington as Chief of the Weather Bureau, July 1, 1891, the MONTHLY WEATHER REVIEW, which had been restricted to the publication of data and notes by the officials of the Weather Bureau, was authorized to enlarge its scope, so that when the American Meteorological Journal ceased, at the close of its 12th volume, the MONTHLY WEATHER REVIEW became the natural and most convenient medium for the publication of meteorological communications of all kinds. On the other hand there has been a danger lest its official character should give undue weight to its editorial notes and to the special articles contributed by both official and nonofficial meteorologists.

As the Chief of Bureau has made the Editor largely responsible for the character of the material published in the REVIEW he has endeavored, by allowing the greatest freedom of publication, to encourage everyone interested in meteorology to publish his best ideas and to philosophically accept honest and kind criticism when the latter is animated solely by a desire to advance our knowledge of the subject. Of course criticism has always something of a personal aspect; it is liable to arouse opposition, replies, and counter replies, and to wound one's personal pride, but by many years of experience we have learned that there are many who hold the progress of science as something far more important than their own personal triumphs. There are those who can calmly weigh the arguments pro and con, and decide with fairness whether a certain view or theory is in accordance with the facts and in accord with the present state of our knowledge; whether it is an error long since overthrown or whether it is an hypothesis too far in advance of our present knowledge to be demonstrable now and one which must therefore be left to future generations to settle.

The sciences can advance only step by step. No one can tell where or when the next important step will originate. Many humble beginners may suggest good ideas that will be confirmed by more eminent investigators after years of work. We must be careful not to ridicule a new hypothesis, but equally careful not to adopt it as a well established principle for fear lest thereby we may be led astray. There has always been a contest between the dullards and conservatives on one side and the bright theorists on the other. The legitimate use of the imagination is the most important consideration to a man engaged in research, but the illegitimate use of the imagination is very dangerous.

If the Editor of the MONTHLY WEATHER REVIEW occasionally allows the publication of a memoir in which the imagination is more prominent than the facts, it is not that he wishes to assist in the propaganda of some new idea, but because he is

confident that the ability of the investigator will eventually enable him to right himself and find his way out of the woods into the clear light of some important truth as yet unknown to us all.

If, on the other hand, the Editor sometimes rejects a communication in which imagination is more prominent than the facts, or in which the facts have been distorted so as to appear to support a preconceived theory, this may be because meteorology is overburdened with ill-founded notions, and students must be discouraged from pursuing really foolish or unimportant lines of work while the important problems of meteorology are almost neglected on account of their difficulty.

The MONTHLY WEATHER REVIEW is therefore a medium for honest, rational discussion of every important problem of meteorology, whether it be approached from the statistical, the experimental, or the mathematical side. It is not carrying on an unreasonable propaganda.—*C. A.*

DIURNAL VARIATION OF THE BAROMETER.

An article in Gaea, for August, 1905, by Doctor Korselt, of the Realgymnasium, or high school, at Annaberg, Germany, on the causes of the diurnal oscillation of the barometer, attempts to show how this oscillation is an important link in the chain of phenomena that results from the unequal warming of our atmosphere by insolation, and its unequal cooling by radiation. This paper is an elaboration of one presented by Doctor Korselt, in 1893, to the International Meteorological Congress at Chicago.

Korselt develops the idea that the atmosphere may be considered as a heat engine, maintained in operation by the periodical accession of solar heat, in which the motion of the atmosphere is the work that is done. The location of the driving force, analogous to a steam boiler, is in the Tropics. The pushing of the hot air from the Torrid Zone toward either pole, and its return as cold air, is renewed daily by the rotation of the earth, and is analogous to the expansion and contraction of the steam cylinder. His memoir of 1905 develops this conclusion in a popular way, without the ordinary formulas of mechanics; and he also concludes that the minute study of the daily barometric oscillation can be of great value for practical forecasting, because it ought to give us information about conditions in the atmosphere at altitudes which balloons have not yet been able to attain. If, for instance, we compiled a daily weather chart, showing the observed difference between the barometric ranges by day and by night (that is to say, the day range between the 10 a. m. maximum and the 4 p. m. minimum, and also the night range between the 10 p. m. maximum and the 4 a. m. minimum), we shall, he thinks, probably find that any temporary area of low pressure has a tendency to move toward the region where this difference of the ranges is a minimum.

The application of Korselt's rule can probably be tested in the United States better than in any other part of the world, since every regular station has its self-recording barometer, and could easily telegraph every morning the extent of the day range and night range during the preceding twenty-four hours. On the other hand these ranges are so small, and often so completely covered up by the nonperiodic changes, that relatively very large and misleading errors would seem to be inevitable.—*C. A.*

INFLUENCE OF THE OCEAN ON CONTINENTAL PRECIPITATION.

In a recent paper before the Société Helvétique des Sciences Naturelles on the interchange of moisture between land and sea,[1] Prof. Dr. Ed. Brückner estimates that 93 per cent of all the water evaporated from the ocean is returned to it in the form of precipitation, leaving but 7 per cent available for distribution over the land surface. Of the total precipitation over the land, 20 per cent is supplied directly by the ocean, while the remaining four-fifths is the recondensation of vapor evaporated from the continents.

Professor Brückner's figures appear to be based upon the following approximate data:

1. Total evaporation from the sea, 384,000 cubic kilometers.
2. Total precipitation upon the land surface, 122,000 cubic kilometers.
3. Total volume of water returned to the sea by rivers, 24,000 cubic kilometers.

It is evident that in the long run as much water must be returned to the ocean as is taken from it. We may consider that this water is returned to the ocean in three ways: (*a*) by precipitation of water evaporated from the ocean surface; (*b*) by precipitation of water evaporated from the land and carried by winds over the ocean; (*c*) by rivers.

The rivers, therefore, are the means by which the land returns to the ocean all of the oceanic waters carried over the land and not returned in the form of aqueous vapor (as given under *b* above), and the total volume of the rivers therefore represents the difference between the amount of vapor passing from the sea over the land and that passing from the land over the sea.

By subtracting the third quantity from the first, we obtain the total precipitation over the ocean, while the difference between the second quantity and the third gives the land precipitation due to evaporation from the land.

If we might depend upon the accuracy of these figures and the underlying assumptions, it would appear that were the influence of the oceans eliminated the continents would still receive four-fifths of their present precipitation. But it is obvious that the three quantities above given are derived from measurements both incomplete and inexact. The accurate determination of evaporation is a problem that much investigation has never solved. Of the total discharge of the Amazon, the largest of rivers, and of the rainfall in its sparsely inhabited basin we have but a vague idea. The large rivers of China have never been systematically measured, and the same is true of the precipitation over extensive provinces of this secluded country. Africa has many regions as yet guiltless of the rain gage and rivers unstudied by the hydrographic engineer. In all countries numerous smaller streams, individually too unimportant to demand investigation, augment by a considerable total annual volume the waters of the sea. With the spread of civilization and the increased application of scientific methods to practical ends, we may hope to approximate closer and closer to the true values of such large factors as Professor Brückner considers. In the meantime, his figures may be provisionally accepted as indicating that the direct influence of the ocean upon continental precipitation is less than has been generally supposed.—*F. O. S.*

[1] Sur le bilan du cycle de l'eau sur la terre. Archives des sci. phys. et nat. Genève, Oct., 1905. Tome 20, p. 427–30.

PRESSURE AND RAINFALL OVER THE INDIAN MONSOON AREA.

Dr. W. L. Dallas, first assistant of the Indian Meteorological Office, has presented to the American Philosophical Society a memoir on the above subject, of which an abstract is published in the proceedings of that society, Vol. XLIV, pages 159–163, from which we quote the following:

> The investigation has brought out certain relationships which appear at least worthy of record. The tentative conclusions arrived at are as follows:
>
> (1) That over the trades-monsoon area, and most markedly so over the equatorial belt, there occur four-year oscillations of pressure; (2) that during the rising portions of these oscillations the *general* rainfall of the trades-monsoon area is below, and during the falling portions is above the average, with a well-marked minimum of rainfall in the first year of the cycle and a well-marked maximum of rainfall in the third year; (3)